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A COLLECTING TRIP TO THE NORTHWEST

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Accompanied by Eugene Herman Nanney, a University of Colorado student, I spent the summer of 1927 on a collecting trip to the Northwest. We travelled 4,500 miles by flivver, with a camp outfit, and unnumbered other miles on foot, from Boulder, Colorado, through southern Wyoming, northeastern Utah, Idaho, Oregon, Washington, southern Montana and eastern Wyoming, back to Boulder. We collected mollusks at 140 localities, chiefly in western Oregon and western Washington. A monograph on the non-marine mollusks of these states is now in preparation, in which all of our unpublished land and fresh-water shells will be included. Probably another report will discuss the marine shells.

Two things were very impressive on the trip: 1. The difficulty of finding parking places along the main graded and paved roads of the Northwest where it is desirable to search for mollusks. Parking on the roadway is prohibited and there is seldom space for parking off the roadway. Most of the roads are laterally shouldered or ditched in such a way as to prevent driving off even where there is an open, level space. 2. Along the route travelled, except in western Washington and Oregon, there are not many good

localities for land snails close to the main highways, and time did not permit much digression. Consequently, as stream crossings afforded opportunity to obtain aquatic mollusks, they greatly preponderate in the season's collections.

From McCammon, Idaho, nearly to Portland, Oregon, one passes almost continually over arid, sage-covered stretches of land, with very little shrubbery suitable for snail cover, no rock slides, and with green fields only in scattered valleys here and there. Even in the moist belt along the coast, with its luxuriant vegetation, shell-bearing snails are not so plentiful, generally distributed and easy to find as one would expect. This has always seemed surprising to me. I found the same difficulty in locating colonies of land snails in Alaska, northwestern British Columbia and Yukon Territory, where aspen groves that looked promising only yielded a few small species. Pilsbry and Cooke mention the relative scarcity of land snails on Vancouver Island. One reason may be the general prevalence of non-calcareous rocks and coniferous forests, neither of which are favorable to most snails.

We found the big, beautiful *Monadenia fidelis* (Gray) abundant in only one colony, at Empire, Oregon. *Haplotrema* was more generally distributed, but nowhere abundant. Only one lot of *Polygyra townsendiana* (Lea) was found, between Astoria and Portland, but a fine lot of 53 specimens from Blaine, Oregon, sent in by Alex Walker, included two examples of *P. t. brunnea*, recently described from south of Kelso, Washington, by Vanatta. Doubtless we would have found more terrestrial material had we searched more industrially, but it was discouraging work, we were pressed for time and our real object was to get the fresh-water material, which stands more in need of study.

In passing through Wyoming, Idaho, Montana and eastern Oregon and Washington, there was constant temptation to leave the highway and get into the foothills and mountains after *Oreohelix*, but had we done so we would never have reached our real objective, the coast, so we

could only say, "Get thee behind us, Satan!" and step on the gas.

We hoped to pick up the trail of *Goniobasis* in northern Idaho and eastern Oregon and Washington, as it has been found there, though absent from southern Idaho, Wyoming and Colorado; but we found none until after we passed Portland, though we have specimens from The Dalles received from other collectors. We obtained *G. silicula* (Gould) from 28 stations, from 15 miles south of Bandon, Oregon, to Aberdeen, on the Washington Coast, and inland nearly to Seattle, but none north of Seattle and none by the north side of the Olympic Mountains. *G. plicifera* (Lea) we obtained at 7 stations, all in the Willamette Valley, except Astoria, Oregon, and Centralia, Washington. Many authors have made *silicula* either a synonym or variety of *plicifera*. Upon examination of large numbers of both from many localities scarcely any indications of intergradation have been found and I nowhere found them mingled or found any lot that could not be easily identified definitely as one or the other. Hence I consider them distinct species. Perhaps others have had a very different experience with them. Possibly the absence of *Goniobasis* northward and eastward in the Puget Sound Basin may be due to the fact that the whole region was heavily glaciated, and sufficient time has not elapsed since the retreat of the glaciers for the genus to re-establish itself. A more thorough search may locate some colonies beyond where we found them. *Margaritifera* (*Margaritana*) also we failed to find very far north of Seattle, and only one colony on the north side of the Olympics, Crescent Lake.

A great surprise was the comparative scarcity of *Pisidium*, *Physa*, *Lymnaea* and the larger species of *Planorbis*. Many stations that yielded only a few examples of any of these genera presented conditions similar to stations where they fairly swarm in some other regions. At only two or three stations in the coastal region were any of them abundant. A quiet bay, now almost cut off by a turnpike,

at the northwest end of Lake Whatcom, in the edge of Bellingham, seems to be the type locality of the interesting *Lymnaea stagnalis occidentalis* "Hemphill" Baker, where it was associated with fine, large *Planorbis binneyi* Tryon. Other parts of the lake visited by us seemed less favorable, but in 1925 we found a few of each of these species at the south end.

Anodonta nuttalliana, *oregonensis* and *wahlamatensis* were all described by Lea, from the Willamette River, near its junction with the Columbia. These three, with *A. californiensis* Lea, are closely related and appear to intergrade. We had hoped to be able to obtain for careful study a large quantity of the three first-named, from various stations in the region of the type locality, but when we were there the water was altogether too high for successful collecting.

Marine collecting is excellent at some localities on the Oregon and Washington coasts, such as Sunset Bay, south of Coos Bay, but nowhere did we find as many species in a short time as at Fidalgo Island on Puget Sound, or at some California localities. Although much of the coast of both states is rugged, with steep bluffs and rocky islets, suggestive of numerous rocky points exposed to the surf and many tide pools, yet at most localities visited by us immense quantities of sand eroded from the bluffs by storm and wave have accumulated about the bases of the rocks and thus prevented the development of tide pools and other ideal conditions favorable to large faunas of littoral marine invertebrates.

One accustomed to the Southern California beaches misses such familiar shells as *Donax*, *Tivela*, *Crucibulum*, *Polinices*, etc. Compensation for this lack lies in the great abundance and variety of *Thais*, so variable in color and sculpture that one is almost tempted to take all within reach. The Oregon-Washington faunas, as would be expected, are much more nearly allied to those of northern California, with a strong representation of Alaska species. The brackish-water mud-flat genera *Cerithidea* and

Melampus, so abundant in some bays of southern California, as at San Pedro, are absent from Oregon and Washington bays.

Echinodermata are well represented on these coasts. The sand-dollars of California we found as far north as Pacific Beach, Washington. Purple urchins were abundant at many localities, forming a beautiful sight when mingled with immense, expanded, green sea-anemones in clear, quiet tide pools. The little six-rayed starfish (*Leptasterias*) is very common under rocks. We obtained two of the twenty-rayed starfishes (*Pycnopodia*) and several other species. The starfish everywhere in evidence in great abundance and exceedingly variable in color, is *Pisaster ochraceus*. In places we saw scores of them in close contact with one another. On parts of the jetty at Newport, Oregon, one could scarcely walk over the big rocks without stepping on starfishes.

HUNTING HELICES IN CALIFORNIA

(Extracts from a letter to the Editor)

Long Beach, California,
September 11, 1927.

The first week in August I set out with my Buick and camp outfit for a three weeks' shell collecting vacation.

I went up the Coast road as far as Gaviota Pass the first afternoon; next morning went on to Morro Bay. Found half a dozen good *Helminthoglypta traski phlyctaena* Bartsch (one alive), near Las Crucis. Stayed one day for early tide at Morro, and went on to Cayucos for three more early tides. I collected land shells at three stations near Cayucos. They seem to be related to the specimens I sent you in June from Salmon Creek. I extracted some of the animals after drowning and now have them in alcohol for you, also one *H. t. phlyctaena*. This shell from around Cayucos seems to puzzle me. I have had nothing like it